US Army Corps of Engineers
St Paul District

AROUND the ROPE

Mississippi River Headwaters Resevoir Study

Volume 2; Issue #2, May 2004

US Forest Chippewa National Forest

Planning for future environmental conditions of the Headwaters

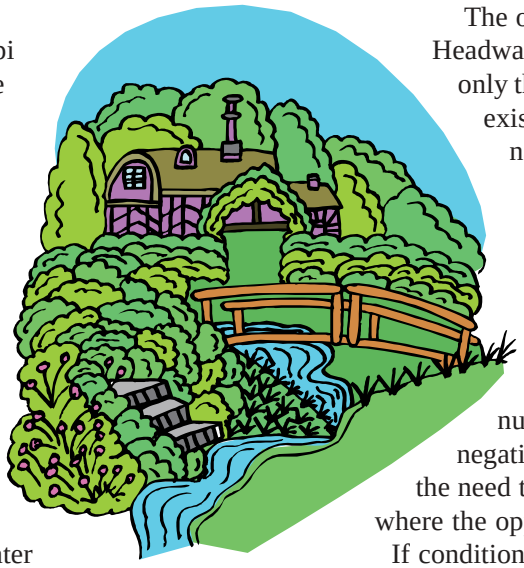
At a glance, the natural resources of the Headwaters Reservoirs of the Upper Mississippi River and the downstream river reach from the Headwaters to the Twin Cities are in good condition. Fish and wildlife are generally abundant and the aquatic vegetation in most areas appears to be diverse and healthy. However, at closer inspection, it becomes apparent there are areas of concern and the potential for improvement.

The existing condition of the area has been developed by many factors. Of most interest here is that the seven federal Headwaters reservoirs have been subjected to an unnatural hydrologic cycle for more than 100 years. Since the late 1930s, the reservoirs have been operated with increasingly stable water levels, partially to aid recreation. Additionally, the reservoirs are operated to reduce downstream flooding, which is accomplished by unnaturally storing water and releasing it later, and by drawing down the reservoirs in late fall and winter, a time when water levels would naturally be stable and low.

These deviations from a natural hydrologic cycle can lead to a number of problems for the aquatic community. The organisms living in the Headwaters have adapted their life cycles to coincide with the natural hydrologic cycle. If flooding no longer occurs in a marsh or occurs later than normal, suitable habitat may not be available during the spawning period for certain fish, such as northern pike.

The lack of periodic low water would prevent the reestablishment of emergent vegetation, such as bulrush and cattails, around the reservoirs and in connecting wetlands.This operating plan also adversely impacts fish and wildlife along the Mississippi river and its tributaries for hundreds of river miles downstream of the dams.

Delaying and reducing spring flood pulses would affect reproductive activities for many species. The results of such problems would have developed gradually and would often be subtle; but when taken together, these smaller effects can add up to major negative impacts. Furthermore, because of the interconnectedness of the aquatic community, an impact on one species or group can impact numerous others. For example, a decline in the vegetation would impact numerous species of fish, waterfowl and mammals.



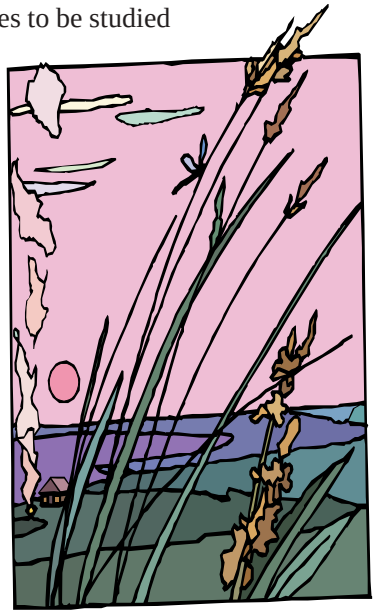
The operation of the Headwaters reservoirs is not the only thing impacting the existing condition of the natural resources of the Headwaters. Human impacts, such as development, shoreline modification, agriculture and the introduction of exotic species, all have negative impacts. This number of potential negative influences reinforces the need to improve conditions where the opportunity to do so exists.

If conditions are reasonably acceptable now, why should we go through the trouble of changing things to improve conditions? The answer to this can be found in examining what the future conditions of the Headwaters may be with and without changes. The Mississippi River Headwaters Reservoir Operating Plan, or ROPE, will address these issues more completely. It is reasonable to assume that the increase in human pressure in the Headwaters will continue and will have an increasing negative impact on the natural resources. There is the potential for the loss of species, declines in fish stocks, degraded water quality, decreasing waterfowl numbers and a general decrease in the resilience of the environment to absorb negative impacts.

Even though the operation of the reservoirs is only one factor of many affecting the condition of the natural resources of the Headwaters, it is still an important one and one that is relatively easy to control. Implementing an operating scheme that is more natural would improve conditions for many organisms. Also, it would encourage the initiation of other habitat-improvement projects within the region. Finally, it has been shown many times that it is often easier to prevent environmental degradation than it is to repair it.

Corps to host environmental impact statement meetings

The U.S. Army Corps of Engineers and the U.S. Forest Service will conduct public scoping meetings to gather input on the potential effects of new reservoir operation plan alternatives to be studied under the ROPE. The meetings will be used to present potential impacts that will be studied in detail within the ROPE and to obtain additional public input regarding possible alternative plans and associated impacts that should be studied but are not currently planned. These meetings will serve to meet the National Environmental Policy Act scoping requirement. As part of the environmental impact statement, comments are requested from persons or organizations that may be interested or affected.



The scoping meetings will be held in an informal open house format that will consist of a short presentation of current information on the ROPE followed by a session for gathering citizen and stakeholder inputs. Participants are welcome to come at any time during the session; they should plan to spend at least 20 minutes to view the presentation and have their questions answered.

To allow for the greatest participation, the meetings will be held at four different locations along the Upper Mississippi River, as follows.

- **Twins Cities metropolitan area.** Monday, June 7, 2004, from 5-7:30 p.m., at the Brooklyn Park Library, 8600 Zane Ave. N., Brooklyn Park, MN 55443
- **Walker area.** Wednesday, June 9, 2004, from 5-8 p.m., at the AmericInn, 907 Hwy. 371 N., Walker, MN 56484.
- **Grand Rapids area.** Thursday, June 10, 2004, from 5-8 p.m., at the Grand Rapids Area Library, 140 NE Second St., Grand Rapids, MN 55744.
- **Brainerd area.** Friday, June 11, 2004, from 5-7:30 p.m., in the Administration Building, Gull Lake Recreation Area, 10867 E. Gull Lake Dr., Brainerd, MN 56401.

Meetings are also being coordinated with interagency and tribal interests to gather additional pertinent study related input. For more information on these meetings, please contact Aaron Snyder at 651-290-5489 or Aaron.M.Snyder@usace.army.mil

Many problems and opportunities already identified

The ROPE study thus far has identified a number of problems and opportunities within the study area. Individual citizens, stakeholders and agency representatives have identified these though previous meetings held early in the study process. It is important to note that many of the problems are complex and inter-related. And, that in order to solve a problem there may be a resulting new problem, due to the nature of tradeoffs. See the ROPE website at: www.mvp.usace.army.mil/rope for more information.

The primary problems that have been identified so far focus on reservoir operations related to flooding and drought damages, habitat degradation and shore erosion, constraints to recreational uses, impacts to tribal uses and needs for preservation of cultural resources. In addition, a number of the problems identified are not as directly related to reservoir operations; these include pollution and water quality problems, increased development pressures, and the need for new water control structures to help improve recreation opportunities and tourism.

The ROPE study has dentified a number of key opportunities that are worthy of trying to take advantage of during the formulation of new operating plans. The primary opportunity identified is to use the current cooperative spirit of reservoir operators to improve systemwide operations (i.e., the Corps of Engineers, the U.S. Forest Service, the Minnesota Department of Natural Resources and Ottertail Power Company).

Another key opportunity identified is there are ways to operate the reservoirs so as to improve and restore natural habitats that could significantly foster long-term public recreation/tourism, foster tribal uses and improve the overall quality of life for citizens. The ROPE study, will provide valuable long-term resource management and planning tools for future interagency decision-making that will allow more comprehensive evaluations to be done to address ongoing water resource management in the study area.

An important measure of the success of this study will be in how effectively the identified problems are solved and the key study opportunities are realized through new operational plans contained in the final ROPE study recommendations.

Historic operations provides current prospective

The historic operations of the Headwaters have impacted the river, its inhabitants and the economy. Initially, general rules for the regulation of the Mississippi Headwaters reservoirs were first established by the War Department in 1889. These rules and regulations were formally modified in 1931, 1935, 1936, 1944 and 1988, along with numerous minor changes along the way. The ROPE study is exploring alternatives which could result in changes both major and/or minor to the Headwaters and the Mississippi River. Some of the past changes are introduced here to give an example of what kinds of changes may occur in the system.

Initially, the area surrounding the Headwaters lakes was largely undeveloped when the dams were first built in the late 1800s and early 1900s, consequently there were no serious objections to widely fluctuating lake levels.

As a result, the first regulation governing the operation of the Headwaters dams (1889) did not contain any information on water levels. However, as recreation on the reservoirs and downstream agriculture developed in the first quarter of the 1900s, local landowner interests became more important in determining reservoir regulation rules. In addition, the need for supplemental releases from the six Headwaters lakes for navigation, power and water supply was greatly reduced as milling interests dwindled and the lock and dam system was constructed in the 1930s.

The initial regulation for the Headwaters was fairly limited, it provided the authority to store water for use in downstream navigation and operating levels were determined on physical limitations and safety concerns. This led to large fluctuations in water levels on the reservoirs, up to eight feet in a given year, because the spring runoff was being stored for the mills and navigation.

In 1931, there were public demands for minimum operating levels to provide resort owners and local residents with more reliable conditions. As a result of these demands, regulations created both high and low water operating limits, as well as minimum discharges for each of the dams and low flow values for St. Paul were specified.

In 1935, low water levels resulted in changing the minimum discharges to an average annual discharge. These discharge changes did not affect Lake Winnibigoshish or Leech Lake, those changes were made in 1936. There were also clarifications to the operational limits which minimized the range of fluctuations in water levels in any reservoir in a single year.

Moderate to severe floods occurred in the Aitkin, Minn., area in 1950, 1952, 1953 and 1954 (and earlier). Concerns about flooding resulted in the construction of the Aitkin Diversion Channel (completed in 1956). Additionally in 1956, flood control guide curves were developed to distribute damages during flood periods.

In 1963, the operating rules for the Headwaters reservoirs were published. Numerous rules were added or changed to include outflow rate-of-change rules, Minnesota DNR minimum and maximum flow guidelines and additional flood control rules.

During the 1976 and 1988 droughts, artificial flow fluctuations (flow sags) along the main stem of the Mississippi River were a problem due to hydropower plants conducting “peaking” operations. As a result in 1996, low-flow management rules were established for Winnibigoshish and Pokegama and other dams all the way down to the Twin Cities.

There were also many additional small changes, such as decreasing the upper ordinary operating limit for Leech Lake 0.5 feet in 1944. Lowering Pokegama Lake’s summer band 0.25 feet in 1952 and Lake Winnibigoshish’s one foot in 1975. Additional rules for regulating Winnibigoshish for walleye spawning were added in 1981.

The effects and degree of these historic changes could be similar to those that may be recommended by the ROPE study. Strategically, the recommended operational changes could take the form of tweaks that optimize operations for current users or it could recommend major systemwide operational changes that would alter river discharges and lake levels in such a way as to significantly improve and sustain environmental outputs for future generations/users.

These very different strategies provide the range of operational strategies that will be evaluated and coordinated as part of the ROPE study. Included in the range of alternative operations are more middle-of-the-road approaches that involves modest operational changes somewhere between tweaking the current operations for each lake and making major systemwide changes in operations.

How to Get More Information

ROPE Contact Information

You can become involved in this study. You can volunteer to be a member of a lake group or just take some time to learn more about the operations of the Headwaters dams by visiting the ROPE website. For more information, please use the following contact information.

Website:http://www.mvp.usace.army.mil/finder/display.asp?pageid=143

Newsletter:

Aaron Snyder 651-290-5489
Aaron.M.Snyder@usace.army.mil
Deborah Griffith 218-692-2025
Deborah.A.Griffith@usace.army.mil

Headwaters Field Offices:

Leech Lake Dam	218-654-3145
Pine River Dam	218-692-2025
Gull Lake Dam	218-829-2797
Pokegama & Winnibigoshish Dams	218-326-6128
Knutson Dam	218-335-8651
Stump Lake Dam	218-751-3120

Task Force Leaders

Ed McNally 651-290-5378
Edward.L.McNally@usace.army.mil
Kenton Spading 651-290-5623
Kenton.E.Spading@usace.army.mil
Nancy Salminen 218-335-8666
nsalminen@fs.fed.us
Steve Clark 651-290-5278
Steven.J.Clark@usace.army.mil
Frank Star 651-290-5328
Franklin.E.Star@usace.army.mil
Brad Johnson 651-290-5250
Brad.A.Johnson@usace.army.mil

St. Paul District Public Affairs 651-290-5201
St. Paul District Toll Free Number 800-290-5847

Letters can be directed to:
Colonel Robert L. Ball, District Engineer, St. Paul District, Corps of Engineers, ATTN: Mr. Edward McNally, Project Management Branch, 190 Fifth Street East, St. Paul, MN 55101-1638.

printed on recycled paper with soy ink

Return Service Requested

U.S. Army Corps of Engineers
St. Paul District
ATTN: PM-A (A. Snyder)
190 5th Street East
St. Paul, MN 55101-1638